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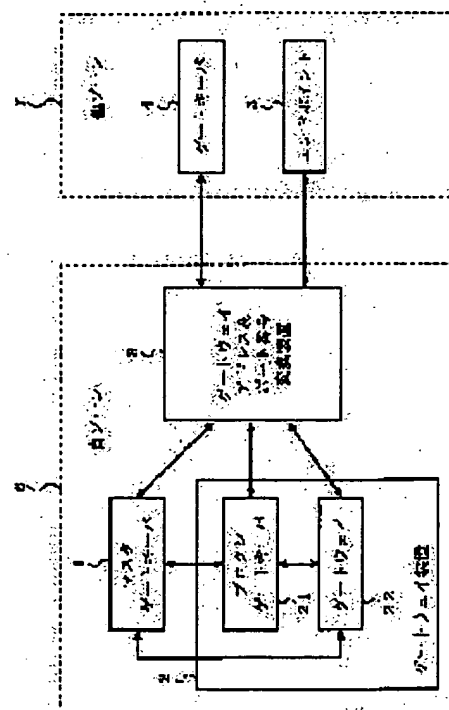
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(54) GATEWAY SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a gateway system adopting the functional distribution of an H.323 gatekeeper where one gatekeeper contains many more gateways by distributing the gatekeeper functions and part of the distributed functions is mounted on the gateway device.

SOLUTION: A gateway device 2 is provided with a proxy gatekeeper 21 and a gateway 22. An H.323 zone 6 consists of a master gatekeeper 1 and the gateway device 2, and the communication with a gatekeeper 4 and an end point 5 of another zone 7 is made through a network address and port number converter 3. Functions of an H.323 gatekeeper are distributed into the master gatekeeper 1 and the proxy gatekeeper 21.



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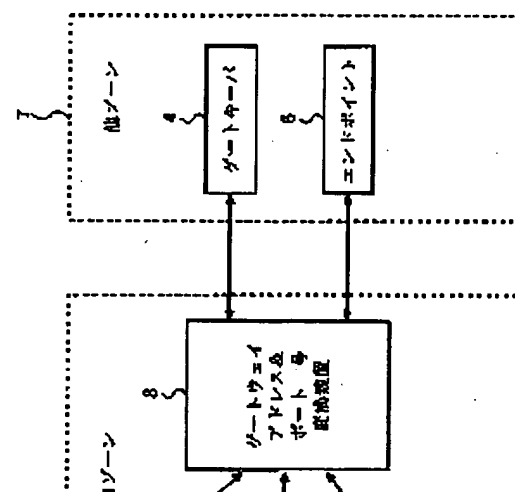
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(54) 【発明の名称】 ゲートウェイシステム

(57) 【要約】

【課題】 ゲートキーパ機能を分割し、一部をゲートウェイ装置に実装することで、より多くのゲートウェイを1つのゲートキーパに収容することができるH.323ゲートキーパ機能分割によるゲートウェイシステムを提供する。

【解決手段】 ゲートウェイ装置2は、ブロッキングゲートキーパ21とゲートウェイ22とを備えている。マスタゲートキーパ1とゲートウェイ装置2とで、H.323ゾーン6を構成し、他のゾーン7のゲートキーパ4やエンドポイント5との通信はネットワークアドレス&ポート番号変換装置3を経由して行う。H.323ゲートキーパの機



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【特許請求の範囲】

【請求項1】 H.323を用いた通信システムにて、他のゾーンとの通信のアドレス変換機能、ゾーン管理機能および呼制御シグナリング機能を含むゲートウェイ制御機能を有するマスタゲートキーバと、

このマスタゲートキーバのゲートウェイ制御機能のうちアドレス変換機能およびゾーン管理機能を有するブロッキシゲートキーバと、

他のゾーンとの通信のプロトコル変換をするゲートウェイとを具備することを特徴とするゲートウェイシステム。

【請求項2】 前記ブロッキシゲートキーバが、呼制御シグナリング機能を有することを特徴とする請求項1に記載のゲートウェイシステム。

【請求項3】 前記ゲートウェイが、前記ブロッキシゲートキーバへの参加要求の送信に対し参加拒否を受信した場合、前記マスタゲートキーバへ参加要求を送信することを特徴とする請求項1または請求項2に記載のゲートウェイシステム。

【請求項4】 ブロッキシゲートキーバとゲートウェイとが、同一の装置内に収容されることを特徴とする請求項1～請求項3のいずれかに記載のゲートウェイシステム。

【請求項5】 前記マスタゲートキーバ、ブロッキシゲートキーバ、ゲートウェイのうちいずれかが他のゾーンと通信する際に、ネットワークアドレスとポート番号とを変換するネットワークアドレス&ポート番号変換装置を有することを特徴とする請求項1～請求項4のいずれかに記載のゲートウェイシステム。

【請求項6】 前記マスタゲートキーバが、前記ゲートウェイへマスタゲートキーバのシグナリング用トランスポートアドレスを通知し、他のゾーンと通信する際に、前記ネットワークアドレス&ポート番号変換装置が、マスタゲートキーバのネットワークアドレスおよびポート番号とブロッキシゲートキーバのネットワークアドレスおよびポート番号とを変換することを特徴とする請求項5に記載のゲートウェイシステム。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、H.323を用いた通信システムにおいて、ゲートキーバ機能を分割し、一部をゲートウェイ装置に実装することで、より多くのゲ

用いられ、プロトコル変換を行う。H.323モデル1ゾーンは一つのゲートキーバと一つ以上のエンドト(ゲートウェイまたはH.323端末)で構成される。トキーバは、アドレス変換、アクセス変換制御お域管理などを行い、ゲートウェイを制御する。1のゲートウェイが多くなった場合には、複数のゲートキーバを用意することでゲートキーバの処理の輻輳するが、ゲートウェイは同時に一つのゲートキーバに登録できないため、ゲートウェイがゲートキーバ構成される複数ゾーンに分割される。

【0003】

【発明が解決しようとする課題】 しかしながら、従来技術には、次のような問題点があった。

【0004】 第1の問題点は、ゲートウェイ数がままで複数ゾーン構成とした場合は呼損率が大きいことである。その理由は、1ゾーンの規模縮小に大群化効果が薄くなるからである。逆に1ゾーンの呼損率を維持するためには、ゲートウェイの設多くなってしまふ。

【0005】 第2の問題点は、1ゾーン構成の場合ゲートキーバの能力により収容可能なゲートウェイ限があることである。1つのゾーンにより多くのウェイを収容するためには、より高性能のゲートを利用しなければならない。

【0006】 本発明は、以上の問題点を解決するH.323を用いた通信システムにおいて、ゲートキーバを分割し、一部をゲートウェイ装置に実装することで、より多くのゲートウェイを1つのゲートキーバに収容することができるゲートウェイシステムを提供とを目的とする。

【0007】

【課題を解決するための手段】 上述の課題を解決め、本発明のゲートウェイシステムは、H.323を用いた通信システムにて、他のゾーンとの通信のアドレス変換機能、ゾーン管理機能および呼制御シグナリングを含むゲートウェイ制御機能を有するマスタゲートと、このマスタゲートキーバのゲートウェイ制御うちアドレス変換機能およびゾーン管理機能を有ブロッキシゲートキーバと、他のゾーンとの通信のブル変換をするゲートウェイとを具備することを特る。

【0008】 以上の構成によって、ゲートウェイ

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ウェイ装置2は、ブロッシングートキーバ21と、ゲートウェイ22とを備えている。マスタゲートキーバ1と、ゲートウェイ装置2とで、H.323にて記述されたゾーン6を構成し、他のゾーン7のゲートキーバ4やエンドポイント5との通信はネットワークアドレス&ポート番号変換装置3を経由して行う。

【0011】図2に示すように、従来のH.323ゲートキーバ8の機能を、マスタゲートキーバ1とブロッシングートキーバ21とにより機能分散する。ブロッシングートキーバ21では、従来のH.323ゲートキーバ8が処理していたゲートウェイ制御機能のうち、アドレス変換機能21aおよびゾーン管理機能21bを持ち、ゲートウェイからのアクセス集中によるボトルネックを解消する。マスタゲートキーバ1は、アドレス変換機能1a、ゾーン管理機能1bの他に、承認制御機能1c、帯域幅制御機能1d、呼制御シグナリング機能1e、呼認可機能1f、帯域幅管理機能1g、呼管理機能1hを持つ。

【0012】ネットワークアドレス&ポート番号変換装置3は、マスタゲートキーバ1、ブロッシングートキーバ21、ゲートウェイ22のうちいずれかが他のゾーン7と通信する際に、ネットワークアドレスおよびポート番号を変換する機能を持つ。ポート番号とはトランスポート層におけるアドレスである。特にブロッシングートキーバ21のネットワークアドレスおよびポート番号を、マスタゲートキーバ1のネットワークアドレスおよびポート番号に変換することで、他のゾーン7のゲートキーバ4やエンドポイント5からはブロッシングートキーバ21の代わりにマスタゲートキーバ1がゾーン6のゲートキーバであるように見える。

【0013】ゲートウェイ22は、従来のH.323ゲートウェイ機能に加え、ブロッシングートキーバ21で参加拒否された呼への参加要求を、改めてマスタゲートキーバ1へ要求する機能を持つ。

【0014】次に、図1、図3、図4及び図5を参照して本実施の形態の動作について詳細に説明する。

【0015】図3において、ゲートウェイ22がエンドポイント5に発信する場合、ブロッシングートキーバ21に対して参加要求A1を送信する。ブロッシングートキーバ21ではアドレス変換機能により、他ゾーン7のゲートキーバ4に位置情報要求A2を送るが、途中ネットワークアドレス&ポート番号変換装置3を経由する際に、位置情報要求A2内のブロッシングートキーバ21のネッ

番号変換装置3を経由する際に、位置情報確認Aマスタゲートキーバ1のネットワークアドレス&番号をブロッシングートキーバ21のネットワークス&ポート番号に変換した位置情報確認A5を転ブロッシングートキーバ21では位置情報確認A5される。ブロッシングートキーバ21は、参加要求受け入れるのであれば許可確認A6をゲートウェイ22へ送信する。ゲートウェイ22では、許可確認A定されたトランスポートアドレスに対し、シグナチャネルA7を開設する。

【0017】一方、図4において、ゲートウェイブロッシングートキーバ21にない機能を必要とする要求B1を送信した場合、ブロッシングートキーバは参加拒否B6を送る。なお、位置情報要求B2位置情報確認B5までの手順は図3における位置情報A2から位置情報確認A5までの手順と同じで参加拒否B6を受信したゲートウェイ22では、改スタゲートキーバ1に対し参加要求B7を送信すスタゲートキーバ1は、参加要求を受け入れるのは、許可確認B8をゲートウェイ22へ送信するトウェイ22では、許可確認B8で指定されたトポートアドレスに対し、シグナリングチャネルB設する。

【0018】また、図5において、マスタゲート1にてシグナリングチャネルを中継する場合を説明する。これは、マスタゲートキーバ1がゲートウェイに通知する許可確認C8において、エンドポイントシグナリング用トランスポートアドレスの代わりにスタゲートキーバ1のシグナリング用トランスポートアドレスを通知する点で図4の例と異なる。これにゲートウェイ22とエンドポイント5との間のシグナチャネルは直接開設されず、ゲートウェイ2スタゲートキーバ1とのシグナリングチャネルCマスタゲートキーバ1とエンドポイント5とのシグナチャネルC10とが開設される。

【0019】次に、具体例を用いて本実施の形態を説明する。例えば、図3においてゲートウェイらエンドポイント5の別名アドレスである'012-89'に対し発信を行う場合、まず、ゲートウェイらブロッシングートキーバ21に対し、この別名アドレス'012-345-6789'への参加要求A1を送信する。シゲートキーバ21では、この別名アドレス'01

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パ1が送信したように見える。

【0020】ゲートキーパ4では位置情報要求A3に対しエンドポイント5に対するシグナリング用のトランスポートアドレス「10.1.2.3:1720」を含めた位置情報確認A4で応答する。位置情報確認A4が途中ネットワークアドレス&ポート番号変換装置3を経由する際に、位置情報確認A4のヘッダ内にあるマスターゲートキーパ1のネットワークアドレス&ポート番号「10.4.5.6:10001」をブロッキシゲートキーパ21のネットワークアドレス&ポート番号「10.7.8.9:5001」に変換した位置情報確認A5を転送し、マスターゲートキーパ1でなくブロッキシゲートキーパ21で位置情報確認A5が受信される。位置情報確認A5の受信によりブロッキシゲートキーパ21ではエンドポイント5に対するトランスポートアドレス「10.1.2.3:1720」を得る。その後、エンドポイント5に対するトランスポートアドレス「10.1.2.3:1720」を含む許可確認A6をゲートウェイ22へ送信する。ゲートウェイ22では、指定されたトランスポートアドレス「10.1.2.3:1720」に対し、シグナリングチャンネルA7を開設する。

【0021】また、図4においてゲートウェイ22がエンドポイント5の別名アドレスである「012-345-6789」に対し発信するためにユーザ認証を含む参加要求B1をブロッキシゲートキーパ21に送信した場合、ブロッキシゲートキーパ21では認証機能を持たないので、参加拒否B6を送る。なお、位置情報要求B2の送信から位置情報確認B5の応答受信までの手順は図3の位置情報要求A2の送信から位置情報確認A5の手順と同じである。参加拒否B6を受信したゲートウェイ22では、改めてマスターゲートキーパ1に対し参加要求B7を送信する。マスターゲートキーパ1は、ユーザ認証が成功し参加要求を受け入れるのであれば、参加要求B8をゲートウェイ22へ送信する。ゲートウェイ22では、許可確認B8で指定されたトランスポートアドレスに対し、シグナリングチャンネルB9を開設する。

【0022】また、図5においてゲートウェイ22からエンドポイント5の別名アドレスである「012-345-6789」に対し発信を行う場合、参加要求C1から参加要求C7までの手順は図4の参加要求B1から参加要求B7までの手順と同じである。マスターゲートキーパ1では、許可確認C8でエンドポイント5に対するトランスポートアドレス「10.1.2.3:1720」の代わりにマスターゲート

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チャンネルC10が、ゲートウェイ22とエンドポイントとのシグナリングチャンネルとなる。

【0023】次に、本発明の他の実施の形態について面を参照して詳細に説明する。図6および図7の形態は、マスターゲートキーパ1の代わりにブロッキシゲートキーパ21がゾーン6のゲートキーパと他ゾーンに見える点で図3～図5の例と異なる。

【0024】図6において、ゲートウェイ22がポイント5に発信する場合、ブロッキシゲートキーパ21に対して参加要求D1を送信する。ブロッキシゲートキーパ21ではアドレス変換機能により、他ゾーン7トキーパ4に位置情報要求D2を送り、位置情報3の応答でエンドポイント5に対するシグナリングトランスポートアドレスを得る。ブロッキシゲート21は、参加要求D1を受け入れるのであれば許可D4をゲートウェイ22へ送信する。ゲートウェイ22では、許可確認D4で指定されたトランスポートスに対し、シグナリングチャンネルD5を開設する

【0025】一方、図7において、ゲートウェイブロッキシゲートキーパ21にない機能を要求する求E1を送信した場合、ブロッキシゲートキーパ2参加拒否E4を送る。参加拒否E4を受信したゲイ22では、改めてマスターゲートキーパ1に対要求E5を送信する。マスターゲートキーパ1は、求を受け入れるのであれば、参加要求E6をゲイ22へ送信する。ゲートウェイ22では、参加6で指定されたトランスポートアドレスに対し、リングチャンネルE7を開設する。

【0026】次に、具体例について説明する。例図6においてゲートウェイ22からエンドポイント別名アドレスである「012-345-6789」に対し発信場合、まず、ゲートウェイ22からブロッキシゲートキーパ21に対し、この別名アドレス「012-345-6789」参加要求D1を送信する。ブロッキシゲートキーパは、この別名アドレス「012-345-6789」を収容すトキーパ4に対し、位置情報要求D2を送り、位置確認D3の応答でエンドポイント5に対するトランスポートアドレス「10.1.2.3:1720」を得る。その後、ドポイント5に対するトランスポートアドレス「2.3:1720」を含む許可確認D4をゲートウェイ2信する。ゲートウェイ22では、指定されたトランスポートアドレス「10.1.2.3:1720」に対し、シグナ

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るのであれば、参加要求E 6をゲートウェイ22へ送信する。ゲートウェイ22では、参加要求E 6で指定されたトランスポートアドレスに対し、シグナリングチャンネルE 7を開設する。

【0028】次に、さらに他の実施の形態について図面を参照して詳細に説明する。図8、図9および図10の実施の形態は、図8を参照すると、プロキシゲートキーバ21が、図2に示された実施の形態におけるアドレス変換機能21a、ゾーン管理機能22Bに加え、呼制御シグナリング機能21eを有する点で図6、図7の例と異なる。それにより、プロキシゲートキーバ21の判断により図9で示すようにゲートウェイ22とエンドポイント5との間のシグナリングチャンネルは直接開設されず、ゲートウェイ22とプロキシゲートキーバ21とのシグナリングチャンネルF 5と、プロキシゲートキーバ21とエンドポイント5とのシグナリングチャンネルF 6とが開設されることが可能となる。

【0029】また、図10を参照すると、本実施の形態は、マスターゲートキーバ1がゲートウェイ22に通知する許可確認G 6において、エンドポイント5のシグナリング用トランスポートアドレスの代わりに、マスターゲートキーバ1のシグナリング用トランスポートアドレスを通知した点で異なる。これにより、ゲートウェイ22とエンドポイント5との間のシグナリングチャンネルは直接開設されず、ゲートウェイ22とマスターゲートキーバ1とのシグナリングチャンネルG 7と、マスターゲートキーバ1とエンドポイント5とのシグナリングチャンネルG 8とが開設される。

【0030】シグナリングチャンネルG 8上で送受信される信号が、ネットワークアドレス&ポート番号変換装置3を通過する毎に、マスターゲートキーバ1のネットワークアドレスおよびポート番号とプロキシゲートキーバ21のネットワークアドレスおよびポート番号とが交換される。その結果、エンドポイント5からは、シグナリングチャンネルG 8はプロキシゲートキーバ21との間に開設されたシグナリングチャンネルG 9のように見える。

【0031】次に、具体例について説明する。例えば、図9においてゲートウェイ22からエンドポイント5の別名アドレスである「012-345-6789」に対し発信を行う場合、まず、ゲートウェイ22からプロキシゲートキーバ21に対し、この別名アドレス「012-345-6789」への参加要求F 1を送信する。プロキシゲートキーバ21で

ランスポートアドレス「10.4.5.6:1720」に対し、ナリングチャンネルF 5を開設する。

【0032】さらにプロキシゲートキーバからエンドポイント5に対するトランスポートアドレス「10.1720」に対し、シグナリングチャンネルF 6を開設し、シグナリングチャンネルF 5とシグナリングチャンネルF 6が、ゲートウェイ22とエンドポイント5とのシグナリングチャンネルとなる。

【0033】また、図10においてゲートウェイからエンドポイント5の別名アドレスである「012-89」に対し発信を行う場合、参加要求G 1から参加要求G 5までの手順は図7の参加要求E 1から参加要求G 5までの手順と同じである。マスターゲートキーバ1許可確認G 6でエンドポイント5に対するトランスポートアドレス「10.1.2.3:1720」の代わりにマスターゲートキーバ1自身のトランスポートアドレス「10.4.5.0」を含む許可確認G 6をゲートウェイ22へ送信する。ゲートウェイ22では、指定されたトランスポートアドレス「10.4.5.7:1720」に対し、シグナリングチャンネルG 7を開設する。さらにマスターゲートキーバ1とエンドポイント5に対するトランスポートアドレス「10.1.2.3:1720」に対し、シグナリングチャンネルG 7とシグナリングチャンネルG 8が、ゲートウェイ22とエンドポイント5とのシグナリングチャンネルとなる。

【0034】ここで、マスターゲートキーバ1からエンドポイント5へ送られる信号内にあるマスターゲートキーバ1のネットワークアドレスおよびポート番号は、ワークアドレス&ポート番号変換装置3を中継する。プロキシゲートキーバ21のネットワークアドレスおよびポート番号に変換される。逆にエンドポイント5からマスターゲートキーバ1へ送られる信号内にあるプロキシゲートキーバ21のネットワークアドレスおよびポート番号は、ネットワークアドレス&ポート番号変換装置3を中継する時点で、マスターゲートキーバ1のワークアドレスおよびポート番号に変換される。したがって、シグナリングチャンネルG 8はエンドポイント5から見た場合、プロキシゲートキーバ21との間に開設されたシグナリングチャンネルG 9のように見える。

【0035】以上述べたように、ゲートウェイ22からエンドポイント5に発信する場合、まずプロキシゲートキーバ21にH.323通信への参加要求を行う。プロ

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加要求を行う。マスタゲートキーバ1は、ゲートウェイ22の参加要求を認めるか否かの判断を行い、許可確認または参加拒否をゲートウェイ22に通知する。ゲートウェイ22では、ブロッキシゲートキーバ21またはマスタゲートキーバ1からの許可確認を受信後、シグナリングチャネルをエンドポイント5との間に開設し、後のH.323の手順を行う。

【0037】これにより、従来1つのゲートキーバで処理可能であったゲートウェイの数よりも多くのゲートウェイを処理することが可能となる。

【0038】

【発明の効果】以上説明したように、本発明は、ゲートウェイのアドレス変換要求をゲートウェイ装置内部のブロッキシゲートキーバで処理し、マスタゲートキーバの負荷を軽減するので、従来1つのゲートキーバで処理可能であったゲートウェイの数よりも多くのゲートウェイを処理することが可能となる。その結果、ゲートウェイの数を増やすにつれ、ゲートキーバの処理能力を向上させたり、ゲートキーバを追加したりする必要がなくなる。

【0039】また、ゲートウェイのアドレス変換要求をゲートウェイ装置内部のブロッキシゲートキーバで処理することによって、アドレス変換のみを必要とするゲートウェイの処理待ち時間を短縮できる。

【図面の簡単な説明】

【図1】本発明のゲートウェイシステムの構成図である。

*【図2】H.323ゲートキーバの機能ブロック図である。

【図3】ゲートウェイとエンドポイント間の送受信図である。

【図4】ゲートウェイとエンドポイント間の送受信図である。

【図5】ゲートウェイとエンドポイント間の送受信図である。

【図6】ゲートウェイとエンドポイント間の送受信図である。

10 【図7】ゲートウェイとエンドポイント間の送受信図である。

【図8】H.323ゲートキーバの機能ブロック図である。

【図9】ゲートウェイとエンドポイント間の送受信図である。

【図10】ゲートウェイとエンドポイント間の送受信図である。

【符号の説明】

1 マスタゲートキーバ

2 ゲートウェイ装置

20 3 ネットワークアドレス&ポート番号変換装置

4 ゲートキーバ

5 エンドポイント

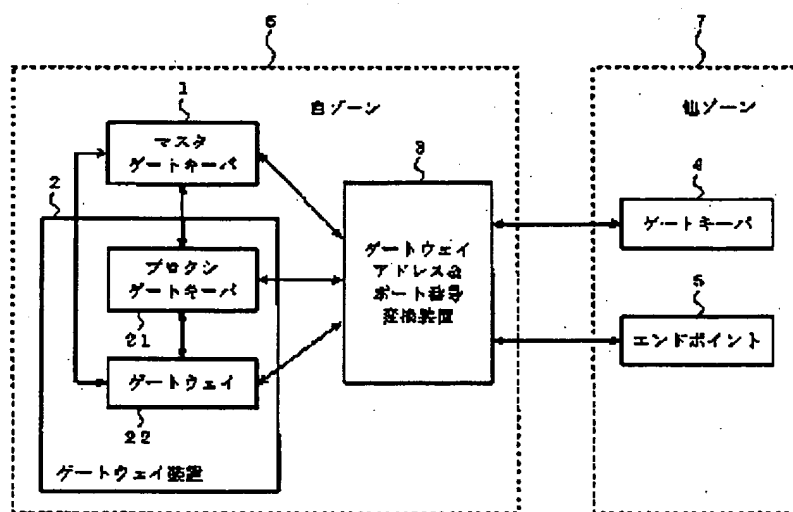
6 H.323ゾーン

7 他のゾーン

21 ブロッキシゲートキーバ

* 22 ゲートウェイ

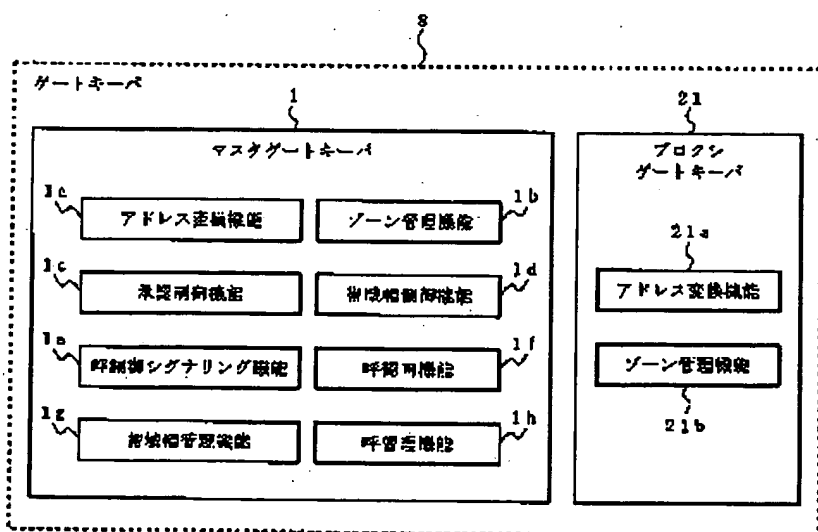
【図1】



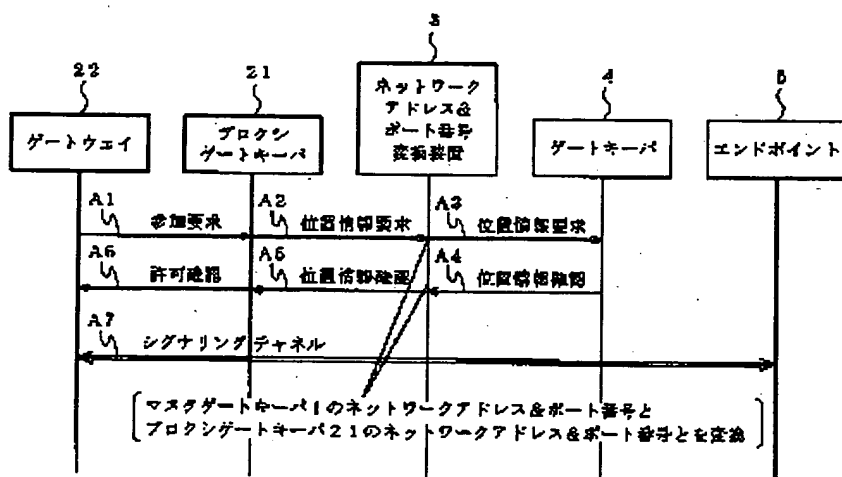
(7)

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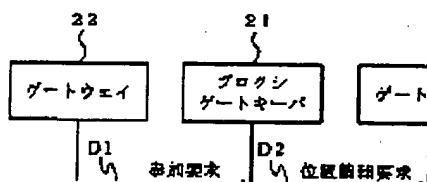
【図2】



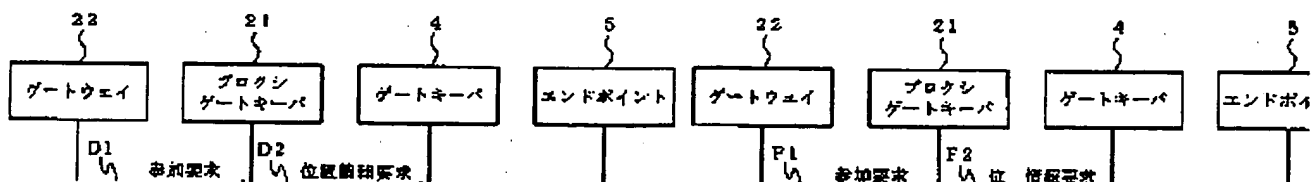
【図3】



【図6】



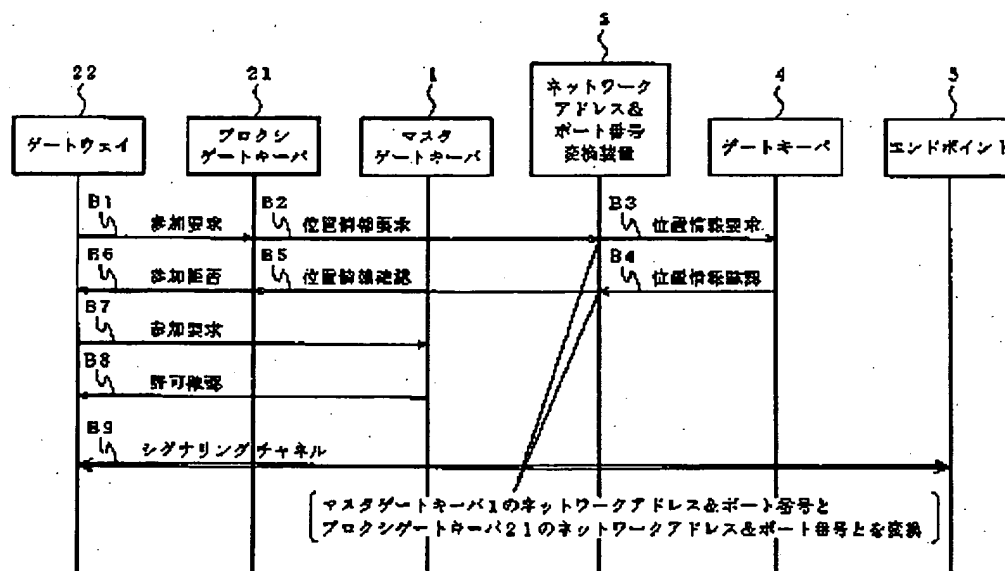
【図9】



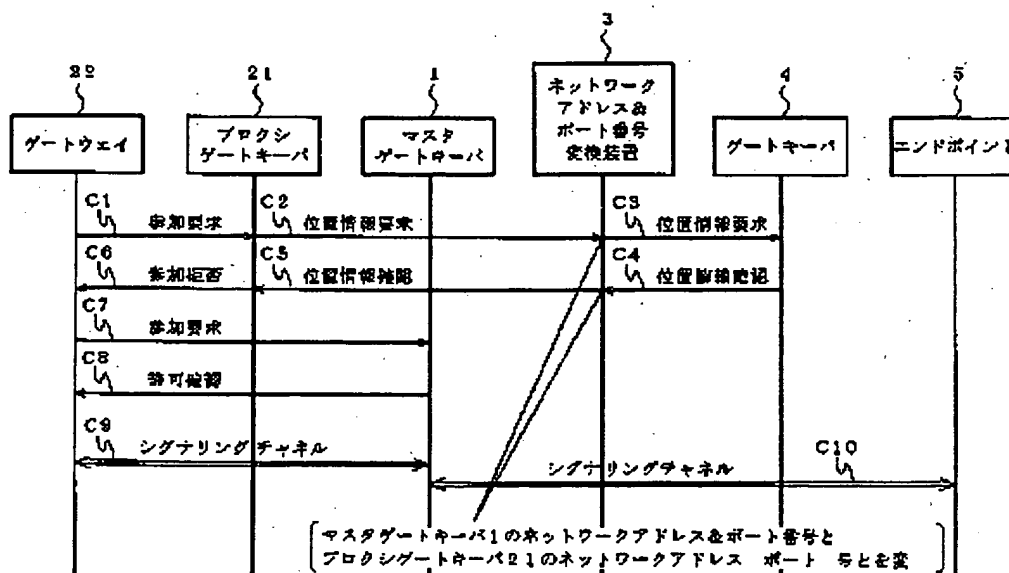
(8)

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【図4】



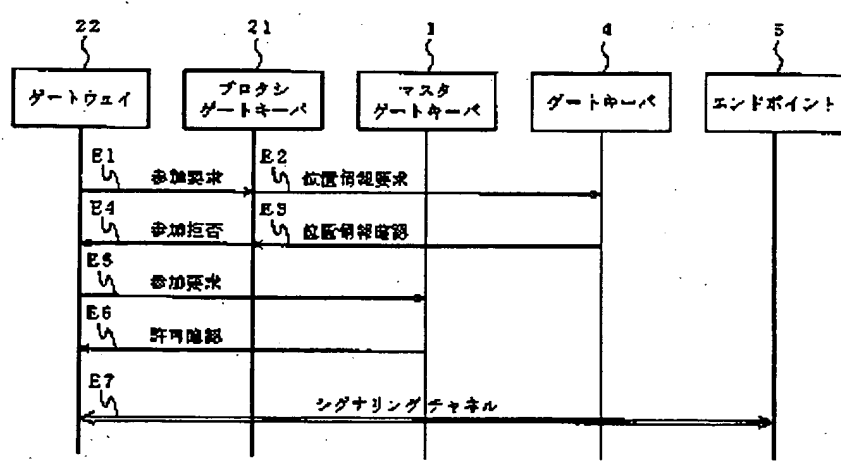
【図5】



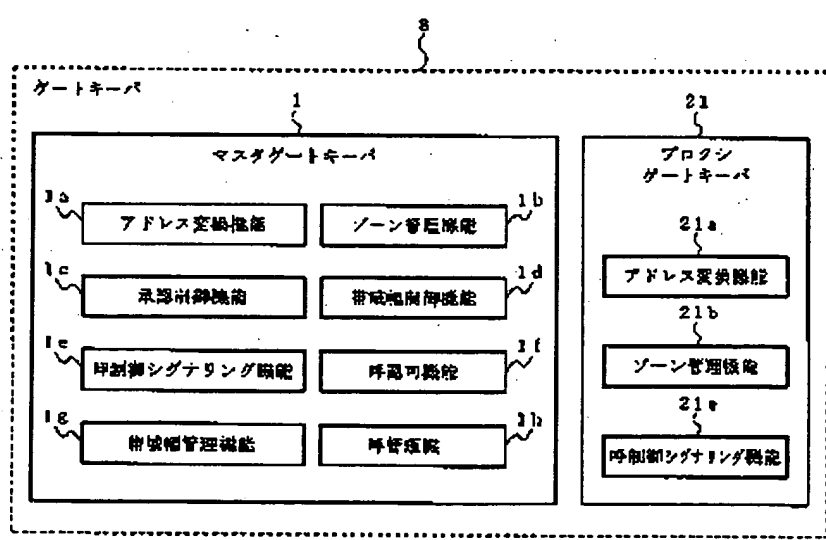
(9)

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【図7】



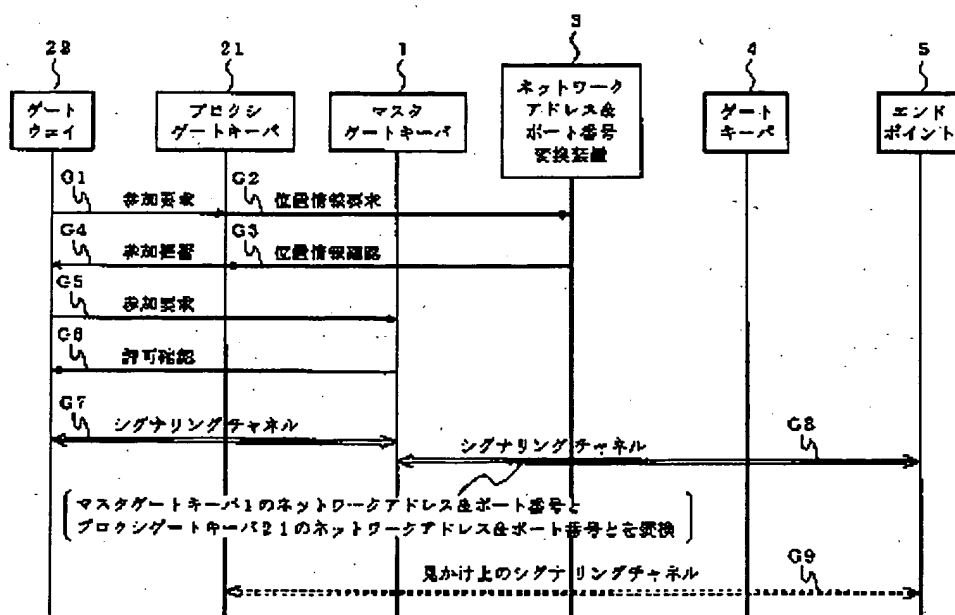
【図8】



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【図10】



* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] In the communication system which used H.323, this invention divides gatekeeper ability and relates to the gateway system by the H.323 gatekeeper ability division which can hold more gateways in one gatekeeper by mounting a part in a gateway unit.

[0002]

[Description of the Prior Art] Conventionally, an H.323 gateway system is used in order to relay communication by ITU-T recommendation H.323 which is the standard specifications of quality-of-service unguaranteeing type LAN (for example, Ethernet (registered trademark) etc.), and communication [in addition to H.323], and it performs protocol conversion. H. One zone is constituted from one or more end points (the gateway or H.323 terminal) by 323 models with one gatekeeper. A gatekeeper performs address translation, access conversion control, band management, etc., and controls the gateway. Although the congestion of processing of a gatekeeper is avoided by preparing two or more gatekeepers when the gateway of one zone increases, since the gateway can be simultaneously registered only into one gatekeeper, it is divided into two or more zones where the gateway is constituted for every gatekeeper.

[0003]

[Problem(s) to be Solved by the Invention] However, there were the following troubles in the above-mentioned conventional technology.

[0004] While the 1st trouble has had the the same number of the gateways, when it considers as two or more zone composition, a lost call rate is with a bird clapper greatly. The reason is that a large herd-sized effect becomes thin according to the degradation of one zone. Conversely, in order to maintain a lost call rate equivalent to one zone, the number of facilities of the gateway will increase.

[0005] In 1 zone composition, the 2nd trouble is that an upper limit is in the number of the gateways which can be held according to a gatekeeper's capacity. In order to hold many gateways by one zone, you have to use a more highly efficient gatekeeper.

[0006] In order that this invention may solve the above trouble, in the communication system using H.323, it divides gatekeeper ability and aims at offering the gateway system which can hold more gateways in one gatekeeper by mounting a part in a gateway unit.

[0007]

[Means for Solving the Problem] In order to solve an above-mentioned technical problem, the gateway system of this invention is characterized by providing the gateway which carries out protocol conversion of communication with the master gatekeeper who has the gateway control function which includes an address translation function, a communicative zone function manager, and a communicative call control signaling function with other zones with the communication system which used H.323, the proxy gatekeeper who has an address translation function and a zone function manager among this master gatekeeper's gateway control functions, and other zones.

[0008] By the above composition, the address translation demand of the gateway is processed by the proxy gatekeeper, and a master gatekeeper's load is mitigated.

[0009]

[Embodiments of the Invention] Next, the gestalt of operation of this invention is explained with reference to a drawing.

[0010] ** [reference of drawing 1 / contain / the master gatekeeper 1, a gateway unit 2, and the network

address & port number inverter 3 / the gestalt of this operation] The gateway unit 2 is equipped with the proxy gatekeeper 21 and the gateway 22. The zone 6 described by H.323 is constituted from a master gatekeeper 1 and a gateway unit 2, and the gatekeeper 4 of other zones 7 and communication with an end point 5 are performed via the network address & port number inverter 3.

[0011] As shown in drawing 2, functional distribution of H.323 conventional gatekeeper's 8 function is carried out by the master gatekeeper 1 and the proxy gatekeeper 21. In the proxy gatekeeper 21, it has address translation function 21a and zone function manager 21b among the gateway control functions which H.323 gatekeeper 8 was processing conventionally, and the bottleneck by the access concentration from the gateway is canceled. The master gatekeeper 1 has recognition control function 1c, 1d of bandwidth-control functions, call control signaling function 1e, 1f of call license functions, 1g of bandwidth function managers, and 1h of call function managers other than address translation function 1a and zone function manager 1b.

[0012] The network address & port number inverter 3 has the function to change a network address and a port number, in case either communicates with other zones 7 among the master gatekeeper 1, the proxy gatekeeper 21, and the gateway 22. A port number is the address in a transport layer. From other gatekeepers 4 and end points 5 of a zone 7, the master gatekeeper 1 seems to be the gatekeeper of a zone 6 instead of the proxy gatekeeper 21 by changing the proxy gatekeeper's 21 network address and port number into the master gatekeeper's 1 network address and port number especially.

[0013] In addition to the conventional H.323 gateway function, the gateway 22 has the function to require anew the participating demand to the call by which participating refusal was carried out by the proxy gatekeeper 21 of the master gatekeeper 1.

[0014] Next, with reference to drawing 1, drawing 3, drawing 4, and drawing 5, operation of the gestalt of this operation is explained in detail.

[0015] In drawing 3, when the gateway 22 sends to an end point 5, the participating demand A1 is transmitted to the proxy gatekeeper 21. In the proxy gatekeeper 21, the positional information demand A3 which changed the network address & port number of the proxy gatekeeper 21 in the positional information demand A2 into the master gatekeeper's 1 network address & port number when it went via the network address & port number inverter 3 the middle, although the positional information demand A2 was sent to the gatekeeper 4 of the other zones 7 is transmitted by the address translation function, and the positional information demand A3 is received in a gatekeeper 4.

[0016] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number of the master gatekeeper 1 in the positional information check A4 into the proxy gatekeeper's 21 network address & port number is transmitted, and positional information check A5 is received in the proxy gatekeeper 21. The proxy gatekeeper 21 will transmit the permission check A6 to the gateway 22, if the participating demand A1 is accepted. In the gateway 22, the signaling channel A7 is established to the transport address specified by the permission check A6.

[0017] When the participating demand B1 which, on the other hand, needs the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 4 is transmitted, participating refusal B6 is sent in the proxy gatekeeper 21. In addition, the procedure from positional information demand B-2 to positional information check B5 is the same as the procedure from the positional information demand A2 in drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the permission check B8 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.

[0018] Moreover, in drawing 5, the case where a signaling channel is relayed by the master gatekeeper 1 is explained. This differs from the example of drawing 4 instead of the transport address for signaling of an end point 5 at the point which notifies the master gatekeeper's 1 transport address for signaling in the permission check C8 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling channel C9 of the gateway 22 and the master gatekeeper 1 and the signaling channel C10 of the master gatekeeper 1 and an end point 5 are established.

[0019] Next, operation of the gestalt of this operation is explained using an example. For example, when

sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 3, the participating demand A1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the network address & port number inverter 3 which sends the positional information demand A2 and carries out a course the middle in the proxy gatekeeper 21 to the gatekeeper 4 who holds this alias address '012-345-6789' The positional information demand A3 which changed the network address & port number "10.7.8.9:5001" of the proxy gatekeeper 21 in the header of the positional information demand A2 into the master gatekeeper's 1 network address & port number "10.4.5.6:10001" It transmits and seems that the master gatekeeper 1 transmitted in a gatekeeper 4 at the time of positional information demand A3 reception. [0020] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 '10.1.2.3:1720' to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number "10.4.5.6:10001" of the master gatekeeper 1 in the header of the positional information check A4 into the proxy gatekeeper's 21 network address & port number "10.7.8.9:5001" is transmitted, and positional information check A5 is received not by the master gatekeeper 1 but by the proxy gatekeeper 21. By the proxy gatekeeper 21, the transport address '10.1.2.3:1720' over an end point 5 is acquired by reception of positional information check A5. Then, the permission check A6 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel A7 is established to the specified transport address '10.1.2.3:1720'.

[0021] Moreover, by the proxy gatekeeper 21, in order that the gateway 22 may send to '012-345-6789' which is the alias address of an end point 5 in drawing 4, when the participating demand B1 containing user authentication is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, participating refusal B6 is sent. In addition, the procedure from transmission of positional information demand B-2 to response reception of positional information check B5 is the same as the procedure of transmission of the positional information demand A2 of drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand B8 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.

[0022] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 5, the procedure from the participating demand C1 to the participating demand C7 is the same as the procedure from the participating demand B1 of drawing 4 to the participating demand B7. In the master gatekeeper 1, the permission check C8 which includes the transport address '10.4.5.6:1720' of master gatekeeper 1 self by the permission check C8 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel C9 is established to the specified transport address '10.4.5.6:1720'. Furthermore, the signaling channel C10 is established from the master gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel C9 and the signaling channel C10 turn into a signaling channel of the gateway 22 and an end point 5.

[0023] Next, the gestalt of other operations of this invention is explained in detail with reference to a drawing. The gestalt of operation of drawing 6 and drawing 7 differs from the example of drawing 3 - drawing 5 at the point by which the proxy gatekeeper 21 is seen from the other zones 7 with the gatekeeper of a zone 6 instead of the master gatekeeper 1.

[0024] In drawing 6, when the gateway 22 sends to an end point 5, the participating demand D1 is transmitted to the proxy gatekeeper 21. At the proxy gatekeeper 21, by the address translation function, the positional information demand D2 is sent to the gatekeeper 4 of the other zones 7, and the transport address for signaling over an end point 5 is acquired by the response of the positional information check D3. The proxy gatekeeper 21 will transmit the permission check D4 to the gateway 22, if the participating demand D1 is accepted. In the gateway 22, the signaling channel D5 is established to the transport address specified by the permission check D4.

[0025] When the participating demand E1 which, on the other hand, requires the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 7 is transmitted, the participating refusal E4 is sent in the proxy gatekeeper 21. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating

demand E6 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.

[0026] Next, an example is explained. For example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 6, the participating demand D1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand D2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check D3. Then, the permission check D4 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel D5 is established to the specified transport address '10.1.2.3:1720'.

[0027] Moreover, by the proxy gatekeeper 21, when the participating demand E1 whose gateway 22 contains user authentication in drawing 7 is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, the participating refusal E4 is sent. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand E6 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.

[0028] Next, the gestalt of other operations is further explained in detail with reference to a drawing. Reference of drawing 8 of the gestalt of operation of drawing 8, drawing 9, and drawing 10 changes it with the example of drawing 6 and drawing 7 in that the proxy gatekeeper 21 has call control signaling function 21e in addition to address translation function 21a in the gestalt of operation shown in drawing 2, and zone function manager 22B. It becomes possible not to establish the signaling channel between the gateway 22 and an end point 5 directly by that cause, as drawing 9 shows by judgment of the proxy gatekeeper 21, but to establish the signaling channel F5 of the gateway 22 and the proxy gatekeeper 21, and the signaling channel F6 of the proxy gatekeeper 21 and an end point 5.

[0029] Moreover, reference of drawing 10 changes the gestalt of this operation instead of the transport address for signaling of an end point 5 at the point which notified the master gatekeeper's 1 transport address for signaling in the permission check G6 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling channel G7 of the gateway 22 and the master gatekeeper 1 and the signaling channel G8 of the master gatekeeper 1 and an end point 5 are established.

[0030] Whenever the signal transmitted and received on the signaling channel G8 passes the network address & port number inverter 3, the master gatekeeper's 1 network address, the network address of a port number and the proxy gatekeeper 21, and a port number are changed. Consequently, from an end point 5, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21.

[0031] Next, an example is explained. for example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 9, the participating demand F1 to this alias address '012-345-6789' is transmitted from measure and the gateway 22 to the proxy gatekeeper 21 By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand F2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check F3. Then, the permission check F4 which includes a proxy gatekeeper's own transport address '10.4.5.6:1720' instead of the transport address over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel F5 is established to the specified transport address '10.4.5.6:1720'.

[0032] Furthermore, the signaling channel F6 is established from a proxy gatekeeper to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel F5 and the signaling channel F6 turn into a signaling channel of the gateway 22 and an end point 5.

[0033] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 10, the procedure from the participating demand G1 to the participating demand G5 is the same as the procedure from the participating demand E1 of drawing 7 to the participating demand E5. In the master gatekeeper 1, the permission check G6 which includes the transport address '10.4.5.7:1720' of master gatekeeper 1 self by the permission check G6 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel G7 is established to the specified transport address '10.4.5.7:1720'. Furthermore, the signaling channel G8 is established from the master

gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel G7 and the signaling channel G8 turn into a signaling channel of the gateway 22 and an end point 5.

[0034] Here, when the master gatekeeper's 1 network address and port number in the signal sent to an end point 5 from the master gatekeeper 1 relay the network address & port number inverter 3, they are changed into the proxy gatekeeper's 21 network address and port number. Conversely, when the proxy gatekeeper's 21 network address and port number in the signal sent to the master gatekeeper 1 from an end point 5 relay the network address & port number inverter 3, they are changed into the master gatekeeper's 1 network address and port number. Therefore, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21, when it sees from an end point 5.

[0035] Like, when [which was described above] the gateway 22 sends to an end point 5, the participating demand to H.323 communication is first given to the proxy gatekeeper 21. The proxy gatekeeper 21 searches for the arrival-of-the-mail place address of an end point 5 by the address translation function. And in accepting a participating demand, it notifies to a permission check at the gateway 22 including the arrival-of-the-mail place address. In not accepting a participating demand, it notifies the participating refusal including the arrival-of-the-mail place address to the gateway 22.

[0036] In the gateway 22, when participating refusal is carried out, the participating demand to H.323 communication is anew given to the master gatekeeper 1. The master gatekeeper 1 judges whether the participating demand of the gateway 22 is accepted, and notifies a permission check or participating refusal to the gateway 22. In the gateway 22, a signaling channel is established between end points 5 after receiving the permission check from the proxy gatekeeper 21 or the master gatekeeper 1, and the next procedure of H.323 is performed.

[0037] It becomes possible to process many gateways from the number of the gateways which were able to be processed by one gatekeeper thereby conventionally.

[0038]

[Effect of the Invention] As explained above, since this invention processes the address translation demand of the gateway by the proxy gatekeeper inside a gateway unit and mitigates a master gatekeeper's load, it becomes possible [processing many gateways] from the number of the gateways which were able to be conventionally processed by one gatekeeper. It becomes unnecessary consequently, to raise a gatekeeper's throughput or to add a gatekeeper as the number of the gateways is increased.

[0039] Moreover, the processor-limited time of the gateway which needs only address translation can be shortened by processing the address translation demand of the gateway by the proxy gatekeeper inside a gateway unit.

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MEANS

[Means for Solving the Problem] In order to solve an above-mentioned technical problem, the gateway system of this invention is characterized by providing the gateway which carries out protocol conversion of communication with the master gatekeeper who has the gateway control function which includes an address translation function, a communicative zone function manager, and a communicative call control signaling function with other zones with the communication system which used H.323, the proxy gatekeeper who has an address translation function and a zone function manager among this master gatekeeper's gateway control functions, and other zones.

[0008] By the above composition, the address translation demand of the gateway is processed by the proxy gatekeeper, and a master gatekeeper's load is mitigated.

[0009]

[Embodiments of the Invention] Next, the gestalt of operation of this invention is explained with reference to a drawing.

[0010] ** [reference of drawing 1 / contain / the master gatekeeper 1, a gateway unit 2, and the network address & port number inverter 3 / the gestalt of this operation] The gateway unit 2 is equipped with the proxy gatekeeper 21 and the gateway 22. The zone 6 described by H.323 is constituted from a master gatekeeper 1 and a gateway unit 2, and the gatekeeper 4 of other zones 7 and communication with an end point 5 are performed via the network address & port number inverter 3.

[0011] As shown in drawing 2, functional distribution of H.323 conventional gatekeeper's 8 function is carried out by the master gatekeeper 1 and the proxy gatekeeper 21. In the proxy gatekeeper 21, it has address translation function 21a and zone function manager 21b among the gateway control functions which H.323 gatekeeper 8 was processing conventionally, and the bottleneck by the access concentration from the gateway is canceled. The master gatekeeper 1 has recognition control function 1c, 1d of bandwidth-control functions, call control signaling function 1e, 1f of call license functions, 1g of bandwidth function managers, and 1h of call function managers other than address translation function 1a and zone function manager 1b.

[0012] The network address & port number inverter 3 has the function to change a network address and a port number, in case either communicates with other zones 7 among the master gatekeeper 1, the proxy gatekeeper 21, and the gateway 22. A port number is the address in a transport layer. From other gatekeepers 4 and end points 5 of a zone 7, the master gatekeeper 1 seems to be the gatekeeper of a zone 6 instead of the proxy gatekeeper 21 by changing the proxy gatekeeper's 21 network address and port number into the master gatekeeper's 1 network address and port number especially.

[0013] In addition to the conventional H.323 gateway function, the gateway 22 has the function to require anew the participating demand to the call by which participating refusal was carried out by the proxy gatekeeper 21 of the master gatekeeper 1.

[0014] Next, with reference to drawing 1, drawing 3, drawing 4, and drawing 5, operation of the gestalt of this operation is explained in detail.

[0015] In drawing 3, when the gateway 22 sends to an end point 5, the participating demand A1 is transmitted to the proxy gatekeeper 21. In the proxy gatekeeper 21, the positional information demand A3 which changed the network address & port number of the proxy gatekeeper 21 in the positional information demand A2 into the master gatekeeper's 1 network address & port number when it went via the network address & port number inverter 3 the middle, although the positional information demand A2 was sent to the gatekeeper 4 of the other zones 7 is transmitted by the address translation function, and the positional information demand A3 is received in a gatekeeper 4.

[0016] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number of the master gatekeeper 1 in the positional information check A4 into the proxy gatekeeper's 21 network address & port number is transmitted, and positional information check A5 is received in the proxy gatekeeper 21. The proxy gatekeeper 21 will transmit the permission check A6 to the gateway 22, if the participating demand A1 is accepted. In the gateway 22, the signaling channel A7 is established to the transport address specified by the permission check A6.

[0017] When the participating demand B1 which, on the other hand, needs the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 4 is transmitted, participating refusal B6 is sent in the proxy gatekeeper 21. In addition, the procedure from positional information demand B-2 to positional information check B5 is the same as the procedure from the positional information demand A2 in drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the permission check B8 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.

[0018] Moreover, in drawing 5, the case where a signaling channel is relayed by the master gatekeeper 1 is explained. This differs from the example of drawing 4 instead of the transport address for signaling of an end point 5 at the point which notifies the master gatekeeper's 1 transport address for signaling in the permission check C8 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling channel C9 of the gateway 22 and the master gatekeeper 1 and the signaling channel C10 of the master gatekeeper 1 and an end point 5 are established.

[0019] Next, operation of the gestalt of this operation is explained using an example. For example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 3, the participating demand A1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the network address & port number inverter 3 which sends the positional information demand A2 and carries out a course the middle in the proxy gatekeeper 21 to the gatekeeper 4 who holds this alias address '012-345-6789' The positional information demand A3 which changed the network address & port number "10.7.8.9:5001" of the proxy gatekeeper 21 in the header of the positional information demand A2 into the master gatekeeper's 1 network address & port number "10.4.5.6:10001" It transmits and seems that the master gatekeeper 1 transmitted in a gatekeeper 4 at the time of positional information demand A3 reception.

[0020] By the gatekeeper 4, it answers by the positional information check A4 which includes the transport address for signaling over an end point 5 '10.1.2.3:1720' to the positional information demand A3. In case the positional information check A4 goes via the network address & port number inverter 3 the middle, positional information check A5 which changed the network address & port number "10.4.5.6:10001" of the master gatekeeper 1 in the header of the positional information check A4 into the proxy gatekeeper's 21 network address & port number "10.7.8.9:5001" is transmitted, and positional information check A5 is received not by the master gatekeeper 1 but by the proxy gatekeeper 21. By the proxy gatekeeper 21, the transport address '10.1.2.3:1720' over an end point 5 is acquired by reception of positional information check A5. Then, the permission check A6 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel A7 is established to the specified transport address '10.1.2.3:1720'.

[0021] Moreover, by the proxy gatekeeper 21, in order that the gateway 22 may send to '012-345-6789' which is the alias address of an end point 5 in drawing 4, when the participating demand B1 containing user authentication is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, participating refusal B6 is sent. In addition, the procedure from transmission of positional information demand B-2 to response reception of positional information check B5 is the same as the procedure of transmission of the positional information demand A2 of drawing 3 to positional information check A5. In the gateway 22 which received participating refusal B6, the participating demand B7 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand B8 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel B9 is established to the transport address specified by the permission check B8.

[0022] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 5, the procedure from the participating demand C1 to the participating demand C7 is the same as the procedure from the participating demand B1 of drawing 4 to the participating demand B7. In the master gatekeeper 1, the permission check C8 which includes the transport address '10.4.5.6:1720' of master gatekeeper 1 self by the permission check C8 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel C9 is established to the specified transport address '10.4.5.6:1720'. Furthermore, the signaling channel C10 is established from the master gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel C9 and the signaling channel C10 turn into a signaling channel of the gateway 22 and an end point 5.

[0023] Next, the gestalt of other operations of this invention is explained in detail with reference to a drawing. The gestalt of operation of drawing 6 and drawing 7 differs from the example of drawing 3 - drawing 5 at the point by which the proxy gatekeeper 21 is seen from the other zones 7 with the gatekeeper of a zone 6 instead of the master gatekeeper 1.

[0024] In drawing 6, when the gateway 22 sends to an end point 5, the participating demand D1 is transmitted to the proxy gatekeeper 21. At the proxy gatekeeper 21, by the address translation function, the positional information demand D2 is sent to the gatekeeper 4 of the other zones 7, and the transport address for signaling over an end point 5 is acquired by the response of the positional information check D3. The proxy gatekeeper 21 will transmit the permission check D4 to the gateway 22, if the participating demand D1 is accepted. In the gateway 22, the signaling channel D5 is established to the transport address specified by the permission check D4.

[0025] When the participating demand E1 which, on the other hand, requires the function which does not have the gateway 22 to the proxy gatekeeper 21 in drawing 7 is transmitted, the participating refusal E4 is sent in the proxy gatekeeper 21. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand E6 to the gateway 22, if a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.

[0026] Next, an example is explained. For example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 6, the participating demand D1 to this alias address '012-345-6789' is first transmitted from the gateway 22 to the proxy gatekeeper 21. By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand D2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check D3. Then, the permission check D4 including the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel D5 is established to the specified transport address '10.1.2.3:1720'.

[0027] Moreover, by the proxy gatekeeper 21, when the participating demand E1 whose gateway 22 contains user authentication in drawing 7 is transmitted to the proxy gatekeeper 21, since it does not have an authentication function, the participating refusal E4 is sent. In the gateway 22 which received the participating refusal E4, the participating demand E5 is anew transmitted to the master gatekeeper 1. The master gatekeeper 1 will transmit the participating demand E6 to the gateway 22, if user authentication is successful and a participating demand is accepted. In the gateway 22, the signaling channel E7 is established to the transport address specified by the participating demand E6.

[0028] Next, the gestalt of other operations is further explained in detail with reference to a drawing. Reference of drawing 8 of the gestalt of operation of drawing 8, drawing 9, and drawing 10 changes it with the example of drawing 6 and drawing 7 in that the proxy gatekeeper 21 has call control signaling function 21e in addition to address translation function 21a in the gestalt of operation shown in drawing 2, and zone function manager 22B. It becomes possible not to establish the signaling channel between the gateway 22 and an end point 5 directly by that cause, as drawing 9 shows by judgment of the proxy gatekeeper 21, but to establish the signaling channel F5 of the gateway 22 and the proxy gatekeeper 21, and the signaling channel F6 of the proxy gatekeeper 21 and an end point 5.

[0029] Moreover, reference of drawing 10 changes the gestalt of this operation instead of the transport address for signaling of an end point 5 at the point which notified the master gatekeeper's 1 transport address for signaling in the permission check G6 which the master gatekeeper 1 notifies to the gateway 22. Thereby, the signaling channel between the gateway 22 and an end point 5 is not established directly, but the signaling

channel G7 of the gateway 22 and the master gatekeeper 1 and the signaling channel G8 of the master gatekeeper 1 and an end point 5 are established.

[0030] Whenever the signal transmitted and received on the signaling channel G8 passes the network address & port number inverter 3, the master gatekeeper's 1 network address, the network address of a port number and the proxy gatekeeper 21, and a port number are changed. Consequently, from an end point 5, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21.

[0031] Next, an example is explained. for example, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 9, the participating demand F1 to this alias address '012-345-6789' is transmitted from measure and the gateway 22 to the proxy gatekeeper 21 By the proxy gatekeeper 21, to the gatekeeper 4 who holds this alias address '012-345-6789', the positional information demand F2 is sent and the transport address '10.1.2.3:1720' over an end point 5 is acquired by the response of the positional information check F3. Then, the permission check F4 which includes a proxy gatekeeper's own transport address '10.4.5.6:1720' instead of the transport address over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel F5 is established to the specified transport address '10.4.5.6:1720'.

[0032] Furthermore, the signaling channel F6 is established from a proxy gatekeeper to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel F5 and the signaling channel F6 turn into a signaling channel of the gateway 22 and an end point 5.

[0033] Moreover, when sending from the gateway 22 to '012-345-6789' which is the alias address of an end point 5 in drawing 10, the procedure from the participating demand G1 to the participating demand G5 is the same as the procedure from the participating demand E1 of drawing 7 to the participating demand E5. In the master gatekeeper 1, the permission check G6 which includes the transport address '10.4.5.7:1720' of master gatekeeper 1 self by the permission check G6 instead of the transport address '10.1.2.3:1720' over an end point 5 is transmitted to the gateway 22. In the gateway 22, the signaling channel G7 is established to the specified transport address '10.4.5.7:1720'. Furthermore, the signaling channel G8 is established from the master gatekeeper 1 to the transport address '10.1.2.3:1720' over an end point 5. The signaling channel G7 and the signaling channel G8 turn into a signaling channel of the gateway 22 and an end point 5.

[0034] Here, when the master gatekeeper's 1 network address and port number in the signal sent to an end point 5 from the master gatekeeper 1 relay the network address & port number inverter 3, they are changed into the proxy gatekeeper's 21 network address and port number. Conversely, when the proxy gatekeeper's 21 network address and port number in the signal sent to the master gatekeeper 1 from an end point 5 relay the network address & port number inverter 3, they are changed into the master gatekeeper's 1 network address and port number. Therefore, the signaling channel G8 looks like the signaling channel G9 established among the proxy gatekeepers 21, when it sees from an end point 5.

[0035] Like, when [which was described above] the gateway 22 sends to an end point 5, the participating demand to H.323 communication is first given to the proxy gatekeeper 21. The proxy gatekeeper 21 searches for the arrival-of-the-mail place address of an end point 5 by the address translation function. And in accepting a participating demand, it notifies to a permission check at the gateway 22 including the arrival-of-the-mail place address. In not accepting a participating demand, it notifies the participating refusal including the arrival-of-the-mail place address to the gateway 22.

[0036] In the gateway 22, when participating refusal is carried out, the participating demand to H.323 communication is anew given to the master gatekeeper 1. The master gatekeeper 1 judges whether the participating demand of the gateway 22 is accepted, and notifies a permission check or participating refusal to the gateway 22. In the gateway 22, a signaling channel is established between end points 5 after receiving the permission check from the proxy gatekeeper 21 or the master gatekeeper 1, and the next procedure of H.323 is performed.

[0037] It becomes possible to process many gateways from the number of the gateways which were able to be processed by one gatekeeper thereby conventionally.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the gateway structure-of-a-system view of this invention.

[Drawing 2] H. It is 323 gatekeepers' functional block diagram.

[Drawing 3] It is transceiver explanatory drawing between the gateway and an end point.

[Drawing 4] It is transceiver explanatory drawing between the gateway and an end point.

[Drawing 5] It is transceiver explanatory drawing between the gateway and an end point.

[Drawing 6] It is transceiver explanatory drawing between the gateway and an end point.

[Drawing 7] It is transceiver explanatory drawing between the gateway and an end point.

[Drawing 8] H. It is 323 gatekeepers' functional block diagram.

[Drawing 9] It is transceiver explanatory drawing between the gateway and an end point.

[Drawing 10] It is transceiver explanatory drawing between the gateway and an end point.

[Description of Notations]

1 Master Gatekeeper

2 Gateway Unit

3 Network Address & Port Number Inverter

4 Gatekeeper

5 End Point

6 H.323 Zone

7 Other Zones

21 Proxy Gatekeeper

22 Gateway

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CLAIMS

[Claim(s)]

[Claim 1] H. Gateway system characterized by providing the gateway which carries out protocol conversion of communication with the master gatekeeper who has the gateway control function which includes an address translation function, a communicative zone function manager, and a communicative call control signaling function with other zones with the communication system using 323, the proxy gatekeeper who has an address translation function and a zone function manager among this master gatekeeper's gateway control functions, and other zones.

[Claim 2] The gateway system according to claim 1 characterized by the aforementioned proxy gatekeeper having a call control signaling function.

[Claim 3] The gateway system according to claim 1 or 2 characterized by transmitting a participating demand to the aforementioned master gatekeeper when the aforementioned gateway receives participating refusal to transmission of the participating demand to the aforementioned proxy gatekeeper.

[Claim 4] The gateway system according to claim 1 to 3 characterized by holding a proxy gatekeeper and the gateway in the same equipment.

[Claim 5] The gateway system according to claim 1 to 4 characterized by having the network address & port number inverter which changes a network address and a port number in case either communicates with other zones among the aforementioned master gatekeeper, a proxy gatekeeper, and the gateway.

[Claim 6] The gateway system according to claim 5 by which the aforementioned network address & port number inverter is characterized by changing a master gatekeeper's network address, the network address of a port number and a proxy gatekeeper, and a port number in case the aforementioned master gatekeeper notifies a master gatekeeper's transport address for signaling to the aforementioned gateway and communicates with other zones.

[Translation done.]